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# Preliminary Benchmarking and MCNP Simulation Results for Homeland Security

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**Purpose:** To create Monte Carlo N-Particle (MCNP) input stacks for benchmarked measurements sufficient for future perturbation studies and analysis.
**Methods and Materials:** The approach was to utilize historical experimental measurements to recreate the empirical spectral results in MCNP, both qualitatively and quantitatively.
**Results:** Results demonstrate that perturbation analysis of benchmarked MCNP spectra can be used to obtain a better understanding of field measurement results which may be of national interest.
**Conclusions:** If one or more spectral radiation measurements are made in the field and deemed of national interest, the potential source distribution, naturally occurring radioactive material shielding, and interstitial materials can only be estimated in many circumstances. The effects from these factors on the resultant spectral radiation measurements can be very confusing. If benchmarks exist which are sufficiently similar to the suspected configuration, these benchmarks can then be compared to the suspect measurements. Having these benchmarks with validated MCNP input stacks can substantially improve the predictive capability of experts supporting these efforts.

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